## REMARKS

As a preliminary matter, claim 3 is objected to for the reasons set forth on page 2 of the present Office Action. Applicants amend claim 3, as indicated herein, to add "in" after "applied", and Applicants believe this change obviates the Examiner's objection to claim 3.

Claims 1, 3-7, and 11-18 are all the claims pending in the present application, new claims 11-18 having been added as indicated herein.

Claims 1 and 3-7 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. Claims 1 and 3-7 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Claims 1, 3 and 7 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Baun (DE 3610519). Finally, claims 4-6 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Baun.

*§ 112, first Paragraph, Rejections (Written Description) - Claims 1 and 3-7*

With respect to the rejections of the claims under 35 U.S.C. § 112, first paragraph (written description), yet again, the Examiner uses the same rationale as set forth previously. In response, Applicant maintains and augments the arguments set forth in the previous Amendment.

In the Office Action, the Examiner alleges that, since the constitution of "the actuator for applying the micro-vibration to the width direction or the load support direction of the tire" is not described in the specification, the present invention does not fulfil the written description requirement. In the first instance, the specific details of the actuator do not constitute part of the invention and are not claimed, and therefore the Examiner's preoccupation with this point is simply misplaced. Secondly, the actuator may take on various different forms, and applicants do not intend to be limited to any particular form of actuator, so long as it can perform the stated

function of inducing micro vibration as described in the specification. Thirdly, the Examiner is simply incorrect in stating that the constitution of the actuator is not described. In fact, several examples of the actuator are directly disclosed. These include, without limitation, a counterweight on a rotor, an eccentric rotor, a function generator which imposes a vibration waveform on a wheel drive motor's DC output, a generator which imposes a vibration waveform on a steering torque signal of the power steering motor, etc, etc. It is beyond the understanding of the undersigned how the Examiner can maintain that the inventors were not in possession of the claimed invention in view of these disclosures and the working examples given in the specification.

**Request for Interview**

Applicants respectfully request that the Examiner grant Examiner's representatives an interview so that it can be explained why the rejections of claims 1 and 3-7 should be withdrawn (and also to discuss the distinguishing aspects of the claimed invention over the prior art).

*§ 112, second Paragraph, Rejections (Indefiniteness) - Claims 1 and 3-7*

With respect to the rejections under 35 U.S.C. § 112, second paragraph (indefiniteness), the Examiner again simply repeats portions of the previous Office Action. The Examiner does not respond to any of the specific arguments set forth in Applicants' previous Amendment dated July 9, 2004. *See pp. 6-8 of July 9th Amendment.* Accordingly, Applicants maintain the same argument set forth in previous amendments.

Further, Applicants amend claim 1, as indicated herein, for clarification purposes and believe that these amendments as well as previously submitted arguments obviate the Examiner's rejections of 1 and 3-7 under 35 U.S.C. § 112, second paragraph.

*§ 102(b) Rejections (Baun) - Claims 1, 3, and 7*

The Examiner rejects claims 1, 3, and 7 over Baun for substantially the same reasons set forth in the previous Office Action dated February 25, 2004, except the Examiner adds in the present Office Action that, "the vibration has a horizontal component that is applied in the width direction of the tire. Baun's high frequency vibration is considered to be 'higher' than a given response frequency of a vehicle, as is broadly claimed."

Applicants amend independent claim 1[1], as indicated herein, for clarification purposes, and maintain that Baun does not teach or suggest at least the unique combination of operations set forth in claim 1, as argued below.

Claim 1 provides:

> A vehicle control method comprising applying vibration to a tire to change a coefficient of friction in at least one of a longitudinal direction and a width direction of the tire between the tire and the surface of a road so as to control the running state of a vehicle wherein the vibration is micro-vibration having a higher frequency than a response frequency of change in a behavior of the vehicle, wherein the vibration is applied in at least one of a revolution direction and width direction of the tire.

As mentioned in the description of p.23, second paragraph of the present specification, an object of the claimed control method is to improve the running performance of the vehicle by recovering the frictional coefficient in the width direction or in the revolutional direction of the

[1] Support for the claim amendments can be found, in the present specification, at p.9, lines 15-21, p.17, lines 18-24, and page 10, line 14 - page 12, line 5 from the bottom in the specification.

tire, having been reduced when braking is being applied; and this is done by applying the micro-vibration to the tire in the revolutional direction and/or in the width direction of the tire. That is, in order to recover the coefficient of frictional force reduced during applying braking, the present invention provides that micro-vibration is applied to the tire in the revolutional direction and/or in the width direction of the tire. Application of the vibration only in the load support direction of the tire renders it difficult to control the coefficient of the friction between the tire and the surface of a road.

Applicant appends herewith an "explanatory" Fig. 1 (which shows the "friction circle" referred to at p. 21, line 22 - p. 22, line 10 of the specification) for the purpose of further explaning the distinguishing aspects of the present invention. As can be seen from the appended "explanatory" Fig. 1, by letting $F_x$, $F_y$ and $F_z$ denote the longitudinal force, transversal force, and the load, respectively, to be applied to the tire, the magnitude of the resultant force produced by combining $F_x$ and $F_y$ can never exceed the product of the load and the coefficient of frictional force, and this condition can be simply expressed by the formula, $(F_x)^3+(F_y)^2 \leq (\mu \bullet F_z)$. Actually, $\mu$ of the tire exhibits different values between the transversal direction and the longitudinal direction, and therefore the figure becomes an ellipse instead of a circle. The circle is used for the sake of simplicity of the explanation.

When the braking force or the driving force (longitudinal force), namely $F_x$ is increased, the transversal force $F_y$ is decreased. In the present application, by decreasing the coefficient of friction $\mu$, which is caused by application of the micro-vibration in the revolution direction of the tire, the longitudinal force $F_x$ is reduced and in turn the transversal force $F_y$ is recovered (p.22, lines 11-19, and Fig.4 in the specification). On the other hand, when the micro-vibration is

applied in the width direction of the tire, the transversal force $F_y$ is decreased and in turn the longitudinal force $F_x$ is recovered (p.22, line 20-25).

At the time when the force for turning the vehicle is required in order to perform cornering, the turning force can be produced by increasing the transversal force $F_y$ upon reducing the longitudinal force $F_x$ by application of the micro-vibration in the revolution direction of the tire. On the other hand, when the turning force is not required to that extent, it is possible to increase the longitudinal force by application of the micro-vibration in the transversal direction.

In contrast to the situation above, suppose only the load $F_z$ were to be increased. In this case, the outcome is a mere expansion of the size of the friction circle and thus the coefficient of friction force $\mu$ cannot be controlled. Further, when the vibration is applied to the up and down direction, the amount of the load cannot be increased and thus the friction circle cannot be affected. Accordingly, when the micro-vibration is applied only in the up and down direction, it is difficult to improve the running performance of the vehicle by recovering the coefficient of friction $\mu$ reduced during application of braking.

Also, an exemplary result occurs based on the present invention in the case where the vehicle is subjected to an external disturbance in the load support direction (up and down direction). That is, the present invention can result in cancelation of the external disturbance by applying a microvibration having a counter phase with respect to the disturbance in an up and down direction so as to improve the running performance of the vehicle. In this instance, Applicants submit that that the micro-vibration having a counter phase is to be applied on the premise that the "micro-vibration is currently being applied in at least one of the revolution

direction and the width direction of the tire". Thus, mere application of the micro-vibration in the up and down direction only can not produce the effects produced by the present invention.

In contrast with the present invention, BAUN teaches reducing the braking distance or increasing the starting torque so as to improve the grip performance of the tire, which is done by increasing the contact pressure between the tire and the surface of a road that is caused as a result of application of a vibration having an intermediate and high frequency in an up and down direction. Thus, contrary to the teachings of the present invention, BAUN's system makes it extremely difficult, if not impossible, to control the coefficient of the friction force between the tire and the surface of a road.

Thus, the subject matter of the present invention is not only different from that of BAUN, but can not be arrived at in view of BAUN.

At least based on the foregoing, applicants submit that the present invention, as recited in independent claim 1, is patentably distinguishable over Baun. Dependent claims 3 and 7 are patentable at least by virtue of their dependency from independent claim 1.

*§ 103(a) Rejections (Baun) - Claims 4-6*

The Examiner rejects claims 4-6 over Baun for the same reasons set forth in the previous Office Action, and again does not respond to the argument submitted previously in the Amendment dated June 25, 2004.

Applicants submit that dependent claims 4-6 are patentable at least by virtue of their dependency from claim 1. Further, in the previous Amendment, Applicants maintain that the Examiner has not established where Baun discloses any value of amplitude and frequency of a vibration, let alone a range of values for frequency and amplitude. The Examiner never responds

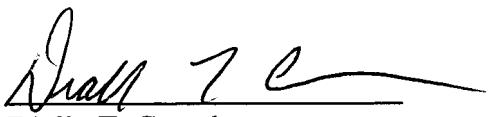
to this particular argument. Accordingly, Applicants maintain these same arguments, and maintain that claims 4-6 are patentably distinguishable over Baun.

Finally, Applicants add new claims 11-18 to provide a varying and better clarified scope of coverage. Applicants submit that these new claims are patentable at least by virtue of their respective indirect or direct dependency from independent claim 1.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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